



**Winston H. Hickox**  
Agency Secretary

# Air Resources Board

**Alan C. Lloyd, Ph.D.**  
Chairman

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**Gray Davis**  
Governor

July 14, 2000

Mailout #MSC 00-13

TO: All Interested Parties

SUBJECT: PUBLIC WORKSHOPS TO DISCUSS PROPOSED REVISIONS TO THE  
CARL MOYER PROGRAM GUIDELINES DATED FEBRUARY 1, 1999

The Carl Moyer Memorial Air Quality Standards Attainment Program (the Carl Moyer Program) and its guidelines were approved on February 25, 1999. For the first three years of the program, the Governor and the Legislature made one-time budget appropriations of \$25 million for the 1998/1999 fiscal year, \$23 million for the 1999/2000 fiscal year, and now -- \$50 million to fund the program in the 2000/2001 fiscal year. In the first two years, the approved guidelines provided air quality management and air pollution control districts (districts) with guidance for administering their local programs, and criteria to evaluate and select reduced-emission heavy-duty engine projects.

Based on Air Resources Board (ARB) and local air district staff experience with program implementation, it is necessary to revise the current Carl Moyer Program guidelines in order to improve the program's ability to achieve its goals. The staff of ARB will conduct three public workshops to discuss proposed revisions to the Carl Moyer Program guidelines. An open comment period will be provided at each of the workshops. However, to better focus the discussion, each workshop will highlight several different key issues. Attached to this notice is a brief update on the current Carl Moyer program, along with a summary of the major proposed revisions. Staff's proposed revisions to the guidelines will be presented at the public meetings noted below.

DATE: Monday, August 7, 2000  
TIME: 10:00 a.m. to 4:00 p.m.  
SUBJECT: Marine Vessels, Forklifts, Dual-fuel Engines, PM  
Baselines  
PLACE: California Air Resources Board  
Auditorium  
9530 Telstar Avenue  
El Monte, CA 91731

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DATE: Wednesday, August 9, 2000  
TIME: 10:00 a.m. to 4:00 p.m.  
SUBJECT: Agricultural Pumps, Off-road Vehicles, Diesel-Hybrids, Minimum 30% NOx Reduction  
PLACE: San Joaquin Valley Air Pollution Control District  
1900 East Gettysburg Avenue  
Fresno, CA 93726

DATE: Friday, August 11, 2000  
TIME: 10:00 a.m. to 4:00 p.m.  
SUBJECT: On-Road, Locomotives, Incremental Fuel Cost, Heavy-Duty Vehicle Repowers, Retrofit Certification Procedure  
PLACE: California Air Resources Board  
Board Hearing Room  
2020 L Street  
Sacramento, CA 95814

Copies of the proposed revisions to the guidelines prepared by staff may be obtained from the Board's Public Information Office, 2020 L Street, Sacramento, CA 95814, (916) 322-2990, 14 days prior to the scheduled meetings. These revisions will also be available electronically on ARB's website at [www.arb.ca.gov](http://www.arb.ca.gov). Further inquiries regarding this matter should be directed to Lucina Negrete, Air Pollution Specialist, at (916) 327-2938, P.O. Box 2815, Sacramento, California, 95814.

Sincerely,

//s//

Robert H. Cross, Chief  
Mobile Source Control Division

Attachment

## ATTACHMENT

### PROPOSED REVISIONS TO THE CARL MOYER MEMORIAL AIR QUALITY STANDARDS ATTAINMENT PROGRAM GUIDELINES

#### BACKGROUND

The Carl Moyer Program Guidelines were approved in February 1999, and districts are currently funding second-year projects. The purpose of the Carl Moyer Program is to reduce emissions early and help California meet its air quality obligations under the State Implementation Plan (SIP). This program provides grants for the extra capital cost of cleaner than required vehicles and equipment that have traditionally been powered by heavy-duty diesel engines. In essence, the program buys critical near-term emission benefits that California needs to meet impending federal air quality deadlines.

Currently, any district may participate in the Carl Moyer Program. In order to participate, however, a district must apply directly to the ARB and provide \$1 in matching funds for every \$2 that ARB provides a district to implement a local program. In addition, district funds must be used for projects that qualify according to the approved Carl Moyer Program Guidelines. District funds may also be used to pay for alternative fuel infrastructure, as long as a district provides ARB with documentation showing that the facility is being used by qualified projects. Lastly, a district may claim up to 15 percent of its matching funds as program administration.

If a district chooses to participate in the program, the district evaluates and selects projects according to the approved guidelines. Projects can be selected from on-road heavy-duty engines, off-road equipment, agricultural pump-engines, marine vessels, locomotives, forklifts, and airport ground support equipment.

#### STATUS OF THE CURRENT PROGRAM

In its first year, the Carl Moyer Program has been an overwhelming success. The demand for project funds exceeded three times the amount of funds available. ARB distributed \$24.5 million (1998/1999 fiscal year funds) in project funds to sixteen local air districts. Forty percent of those funds were used to fund alternative fuel on-road projects, 25 percent to fund marine vessel projects, 20 percent to fund agricultural pumps, 10 percent to fund forklifts, and the remaining 5 percent to fund other diesel repowers (mostly off-road equipment). Staff estimated that projects funded in the first year of the program will reduce oxides of nitrogen (NOx) emissions by about 4 tons per day, and particulate matter (PM) emissions by about 100 pounds per day.

In June 1999, Governor Davis and the Legislature approved a one-time appropriation of \$23 million to fund the Carl Moyer Program through a second year. Of these funds, \$19 million went to ARB to fund engine projects, and \$4 million to the California Energy Commission (CEC) to fund infrastructure and advanced technology development projects. Currently, in the second year of the program, ARB distributed over \$18 million

in project funding to 20 local air districts. Some districts are already obligating 1999/2000 fiscal year funds by selecting and funding projects based on the current approved guidelines. Districts participating in the second year of the program must provide ARB with a program implementation report on or before September 30, 2000.

In October 1999, Governor Davis signed Assembly Bill 1571 (AB 1571 - Villaraigosa, Brulte) codifying and formally establishing the framework for the Carl Moyer Program. According to that legislation, the ARB developed and presented a report to the Governor, Legislature, and the Carl Moyer Program Advisory Board (Advisory Board) on the status of the first year of the program. The Advisory Board, with the assistance of ARB, CEC, and the local air districts, developed its own report with recommendations to the Governor and the Legislature to continue the Carl Moyer Program through 2010 at a funding level of about \$100 million per year. As such, the Governor and the Legislature approved a one-time budget appropriation of \$50 million (\$45 million to ARB for engine projects, and \$5 million to CEC for infrastructure and advanced technology projects) to fund the Carl Moyer Program through a third year (fiscal year 2000/2001).

## PROPOSED REVISIONS

In order to ensure that funding criteria is consistent statewide, even though districts have different implementation schedules, it was necessary to move toward an annual revision schedule. Furthermore, AB 1571 was signed requiring that ARB staff make any revisions to the guidelines available to the public 45 days before final approval. Hence, ARB staff is proposing a number of revisions to the Carl Moyer Program guidelines that will affect projects funded during the third year of the program (2000/2001 fiscal year funds).

ARB staff is developing some of the major revisions to the guidelines as required under current legislation (AB 1571), and as recommended by the Advisory Board. Others are being developed to ensure that emission reductions remain real, quantifiable, and enforceable based on ARB's and districts' experiences during the first year of the program. Some of the major proposed revisions include new chapters to quantify the PM emission reduction benefits of the program and to allow funding for incremental fuel cost. In addition, existing chapters are being revised to update default emission factors; discount factors for marine vessels; and infrastructure costs for agricultural pump engines, etc. There are also some minor modifications to correct discrepancies in the guidelines such as omissions and typographical errors. The following sections provide a brief description of the major proposed revisions.

**PM Baselines.** The Carl Moyer Program was designed to help California meet the NOx emission reductions in measure M4 in the 1994 SIP. Although initially the focus of the program was on NOx reductions, the Advisory Board, ARB, and local air districts recognize that diesel PM is a serious public health concern and PM reductions are necessary throughout California. Many of the technologies already funded under the program, such as electric motors and alternative-fueled engines, also reduce PM. AB 1571 requires ARB staff to consider PM reductions from the Carl Moyer Program. In fact, the Advisory Board established PM criteria through a public process and provided

that criteria to the Governor and the Legislature in a report. The criteria established that the Carl Moyer Program have a goal to reduce PM emissions by 25 percent statewide, except for areas that are non-attainment for the federal PM standard. Those areas designated as serious non-attainment for the federal PM standard are required to reduce PM emissions by 25 percent on a program basis (not a project-by-project basis). Currently, San Joaquin Valley Air Pollution Control District and South Coast Air Quality Management District (SCAQMD), are the only two districts affected by this proposed requirement.

Based on the criteria that have already been established by the Advisory Board, ARB staff is proposing PM emission factors to calculate PM emission reductions from the program. PM emissions will be calculated similar to NOx emission reductions. A new chapter lists default PM emission factors for each project category, and provides examples for calculating project and program PM reductions.

As part of ARB's oversight of the program, ARB staff will determine overall statewide and district compliance with the PM reduction goals and requirements. If the program falls short, ARB staff will propose modifications to the program to achieve the necessary requirements.

**Incremental Fuel Cost.** The Carl Moyer Program is designed to pay the incremental capital cost of vehicles and equipment that are cleaner than required. Funding of incremental fuel costs is not currently allowed under the program. Cleaner alternative fuels and alternative diesel fuels (e.g. diesel-water emulsions, bio-diesel) are available that can reduce NOx and PM emissions. Some non-attainment districts have stated that they need the near-term reductions that those fuels can provide, and would like district funding for incremental fuel costs to count as match funding. ARB staff is requesting comments on the most appropriate way to incorporate funding for incremental fuel costs into the program.

**Dual-Fuel Engines In Transit Bus and Neighborhood Refuse Collection.** Dual-fuel engines are available that are certified to reduce NOx by ~~to~~ up to sixty-two percent of the required NOx standards. Recent in-use test data shows that while these engines deliver full emission benefits in many applications, on the Central Business District cycle (an in-use transit bus test), the emission benefits were 30 percent less. Thus, ARB staff is proposing to discount the dual-fuel engine emission benefits by 30 percent in transit bus applications. ARB staff is working with a dual fuel engine manufacturer to determine the emission benefits in neighborhood refuse collection.

**October 2002 Repowers.** Under the current Carl Moyer Program, electronic-to-electronic repowers have not been allowed. This is due to the off-cycle NOx emissions that occurred in many of the diesel heavy-duty engines manufactured in the early to late 90's. Under settlement agreements, many of the engine manufacturers must introduce new engines with significantly lower NOx emissions beginning in October 2002. Repowering older electronically controlled trucks with these October 2002 engines can significantly reduce emissions. ARB will allow October 2002 repowers under the Carl Moyer Program and staff is working to quantify the emission benefits.

**Incentives to Replace Pre-1987 Heavy-Duty Vehicles.** The Advisory Board recommended that ARB staff consider including a program to provide incentives to replace pre-1987 heavy-duty diesel vehicles with newer model year vehicles. In the past, a heavy-duty engine retirement program was considered by ARB. However, it was a challenge to determine the remaining useful life of the old heavy-duty vehicle, and the emission benefits that could be achieved. Therefore, the heavy-duty engine retirement program was never implemented. Many of those same issues are still of concern with the incentive program. ARB staff is analyzing the issues and the potential emission benefits of an incentive program. Results of that analysis will be presented at the meetings.

**Update Emission Factors.** ARB staff is proposing new NO<sub>x</sub> emission factors to reflect the recently adopted EMFAC2000 emission model, which accounts for the settlement agreement between ARB and the diesel engine manufacturers (regarding excess NO<sub>x</sub> emissions from the use of alternative injection timing strategies). ARB staff proposes emission factors for heavy-duty on-road vehicles based on the model year and gross vehicle weight rating (GVWR). ARB staff also proposes new emission factors for off-road engines to reflect the new off-road model that incorporates the most recent regulations adopted by both U.S. Environmental Protection Agency and ARB for off-road diesel engines.

**Emission Calculations to Account for Activity Level Increase/Decrease.** In general, the emission reduction benefit of a project can be calculated based on either the annual fuel consumed, annual miles traveled, or annual hours operated. However, ARB staff is proposing that when there is an increase/decrease in activity level or horsepower that is greater than 25 percent, emissions must be calculated based on fuel consumed. If the annual fuel consumption is used, an energy consumption factor should be calculated (based on the brake specific fuel consumption of each engine) and the activity level should be based on actual annual fuel receipts. ARB staff proposes that when the annual mileage or hours of operation is the basis for determining the emission reductions, the activity level be based on the vehicle odometer or hour meter.

**Diesel Hybrids.** One of the new heavy-duty technologies being demonstrated is that of hybrid electric engine systems. Manufacturers of this technology are currently focusing on the transit bus market, but this technology could also provide emission reductions in other applications. Recent test data indicates that diesel hybrid transit buses with a particulate filter and low sulfur diesel fuel can achieve PM emission levels comparable to a natural gas transit bus. However, that testing shows that current diesel hybrid technology does not produce the NO<sub>x</sub> reduction benefits of natural gas engines. With further optimization diesel hybrid technology has the potential to significantly reduce both NO<sub>x</sub> and PM. ARB staff is working to develop a certification procedure for heavy-duty hybrids. Until that occurs, however, it is unlikely that reduced emission levels of diesel hybrid vehicles can be validated. Thus, diesel hybrid vehicle projects could only be approved on a case-by-case basis, and ARB staff proposes to evaluate potential projects before any funds are granted. Alternative-fuel hybrid electric vehicles with engines certified to low-emission standards would be eligible for funding under the Carl Moyer Program.

**Discount Factors for Marine Vessels.** There is a degree of uncertainty regarding the amount of offshore emissions that actually reach the mainland. The Southern California Ozone Study (the Tracer Dispersion Study) was conducted and completed by ARB to determine offshore impacts. Results from this study indicate that the emission reductions from marine vessels would benefit ozone, PM, and toxic emissions that indeed reach the mainland. However, due to the uncertainty on the amount of emissions reaching the mainland, ARB staff proposes to calculate benefits from marine vessel projects based on emissions that are near shore.

**Agricultural Pump Electric Motors.** The current program is designed to provide funding for the increase in capital cost between two engines (i.e. diesel engine versus electric motor). Electric motors for agricultural pumps, however, cost less than diesel engines and therefore do not qualify for incentive funding.

ARB is aware of the emission benefits associated with replacing engines with electric motors. Hence ARB evaluated two methods for providing the agricultural communities with incentives to convert to electric motors, funding to cover standby electric charges or funding to install the power line and peripheral equipment necessary for an electric pump. Current data provided by several utility companies indicated that the operating costs, which include standby (or demand) charges, vary based on electrical demand at each site, the type of irrigation system, and time of use (e.g., summer vs. winter, peak vs. off-peak), etc. Furthermore, standby charges may disappear in the near future, since at least one major utility has proposed to eliminate standby charges and reduce rates for select agricultural customers. This effort is being accomplished with support from agricultural communities. Hence, at this time, ARB staff does not propose that additional funding be utilized to cover individual standby charge costs.

ARB did find, however that, the cost of the electric motor plus the cost to set up a power line and connect necessary peripheral equipment to the motor are comparable to the installed cost of a new off-road emission-certified diesel engine. Hence, ARB staff proposes to allow Carl Moyer Program project funds for the incremental cost of power line plus peripheral equipment.

**Expand Forklift Program.** For the first two years of the Carl Moyer Program, funding for electric forklifts has been provided via a demonstration project in the SCAQMD. Under this demonstration program, SCAQMD staff was successful at incentivizing electric forklift projects that would not likely have occurred without funding. In addition, the SCAQMD staff determined that it was appropriate to set a cost-effectiveness criterion of \$3000 per ton of NO<sub>x</sub> reduced for forklift projects. ARB staff proposes to expand the forklift demonstration program statewide, with the cap in place.